## ABSTRACT OF THE DISCLOSURE

Regulatory elements responsible for tissue-specific transcriptional regulation of the human $\beta_3$-adrenergic receptor ($\beta_3$-AR) were identified. A region localized between -6.50 and -6.30 kb of the proximal promoter contained three sequences that act synergistically to achieve full transcriptional activity. One segment, termed segment A, contains an Sp1 binding site. Another of the sequences, termed segment B, is a binding site for a *trans*-acting factor present in cells that constitutively express $\beta_3$-AR. In a specific embodiment, the *trans*-acting factor is expressed in neuroblastoma (SK-N-MC) and brown adipose tissue cells, but little or not at all in CV-1, HeLa, or white adipose tissue cells. The third segment, C, is an S1 nuclease-sensitive site having CCTT repeats. Recombinant vectors under control of this transcriptional regulation region, particularly containing the B and C segments, provide a substrate for high throughput assays, such as reporter gene assays, to identify compounds that can increase the level of expression of $\beta_3$-AR. The B segment nucleic acids also provide for isolation and cloning of the *trans*-acting factor. Mechanisms of transcriptional regulation and identification of other adjacent proteins involved in the regulation of the h$\beta_3$-AR gene expression are provided.